UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF NEW YORK

BARBARA SCHWAB, et al., individually and on behalf of a class of all others similarly situated,	*	
	*	
Plaintiffs,		
	*	Case No:
vs.		
	*	CV-0401945 (JBW) (SMG)
PHILIP MORRIS USA, INC., et al.,		
	*	
Defendants.		
	*	
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EXPERT DISCLOSURE OF W. KIP VISCUSI, PH.D.

1.   My name is W. Kip Viscusi. I am the John F. Cogan, Jr. Professor of Law and Economics and Director of the Program on Empirical Legal Studies at Harvard Law School. I hold a Ph.D., an AM, and an AB (summa cum laude) in Economics, and a Masters in Public Policy, all from Harvard University. Both my Ph.D. and undergraduate theses were awarded prizes for the best economics theses of their years. I have taught economics for 30 years at several universities, including Duke University, Northwestern University, and the University of Chicago, before joining the Harvard faculty. On July 1, 2006, I become the University Distinguished Professor of Law and Economics at Vanderbilt Law School.   I have held editorial positions on 18 economics publications.

2.   I have published approximately 23 books and over 250 articles, most of which deal with different aspects of risk. Two of my books, *Smoking: Making the Risky Decision* (Oxford University Press, 1992) and *Smoke-Filled Rooms* (University of Chicago Press, 2002) directly address perceptions of the risks of smoking. Four of my books have received the American Risk and Insurance Association's Book of the Year Award (1992, 1993, 1994 and 2000). I have also written with John Vernon and Joseph Harrington, *Economics of Regulation and Antitrust, 4th Edition* (Cambridge: MIT Press, 2005), which is the leading textbook in the field. My article, "Alarmist Decisions with Divergent Risk Information," received the Royal Economics Society Prize. I have testified as an expert on many of these issues and have served as a consultant to various government agencies (including EPA and OSHA) on risk-related issues, including smoking. My curriculum vitae is attached.

3.   I have used conjoint analysis and related survey approaches in a series of studies over the past two decades for the U.S. EPA. I have served as the principal investigator and project manager of all these projects. These studies included what is to my knowledge the first use of conjoint analysis to value tradeoffs between money and health risks in Wesley A. Magat, W. Kip Viscusi, and Joel Huber, "Paired Comparison and Contingent Valuation Approaches to Morbidity Risk Valuation," *Journal of Environmental Economics and Management*, 15(1988), pp. 395-411. Most recently, I have used a choice-based conjoint approach to analyze the valuation of water quality in W. Kip Viscusi and Joel Huber, "Hyperbolic Discounting of Public Goods," National Bureau of Economic Research Working Paper 11935 (2006). Many of the studies I undertook for EPA between 1988 and 2006 also used variants of a conjoint survey

structure. The analysis of the conjoint data uses conventional econometric methods of the type I have been using in my published work for almost three decades.

4.   I have been analyzing the tradeoffs people make between money and health risks since my 1976 doctoral dissertation, which received the Wells Prize for best Harvard economics dissertation and was subsequently published by Harvard University Press, *Employment Hazards: An Investigation of Market Performance.* Analysis of the valuation of risks to life and health has been a primary focus of my research, and the results of my work are now used throughout the Federal government to value regulation of risks to life and health.

5.   I have used several approaches to obtain my estimates of the tradeoffs people make between risks and money. The most reliable methods use information on actual market choices that people make. First, I have analyzed the tradeoff between wages and risks on the job, including both fatal and nonfatal risks. These studies are econometric analyses of a large sample of workers, controlling for all other aspects of the job. Second, I have analyzed the price-risk tradeoffs for cars of different safety levels and houses located in areas of different riskiness. As with the wage-risk studies, these studies were econometric analyses that took into account other aspects of the product or house to isolate the value of the price-risk tradeoff. Third, I have used survey methods to value health outcomes for which there is not reliable market evidence, including cancer, chronic bronchitis, nerve disease, skin burns, and child poisonings, among others. These survey approaches have included, among other approaches, contingent valuation, paired comparisons, iterative paired comparisons, and conjoint analysis.

6.   I have been asked by counsel for defendants to examine the conjoint analysis conducted by Dr. John Hauser, and assess its viability as support for plaintiffs' claim of economic damages stemming from the purchase of certain brands of "lights" cigarettes. I have also been asked by defendants' counsel to examine and evaluate the damages estimates provided by Drs. Harris and Beyer.

7.   In doing so, I have reviewed plaintiffs' Second Amended Complaint, the Court's statute of limitations opinion, and the expert reports and depositions of Drs. Hauser, Harris, Beyer, and Dennis, and the depositions of AMS employees Mr. Gaskin and Ms. Schussheim. I have also examined data and other materials produced by Dr. Hauser and Dr. Harris with respect to Dr. Hauser's conjoint and time studies.

I.   Summary of Opinions

8.   Dr. Hauser's conjoint model does not provide a proper measure of economic damages to the class members due to the alleged misconduct that plaintiffs describe in their complaint, nor does its application by Drs. Harris and Beyer. This is a RICO case, in which each class member must demonstrate reliance on the underlying fraud. Dr. Hauser's study does not purport to address the extent to which class members relied on the alleged fraud, or even whether there is any causal relationship between the alleged fraud and the claimed injury.

9.   There is a fundamental mismatch between Dr. Hauser's conjoint study and the loss of property concept. As I will describe in Section III of my expert report, even if perfectly executed, Dr. Hauser's conjoint study is not designed to meet, and would not satisfy the assignment Dr. Hauser set out to accomplish, which was "to assess the value

- 4 -

and importance of health risks to 'light' cigarette consumers in their decision to purchase a 'light' cigarette" [Hauser Expert Report, Schwab, ¶ 4].

10.   In actuality, Dr. Hauser's conjoint study is far from perfectly executed. The study suffers from serious methodological flaws that render its results unreliable and incapable of generalization to the Schwab class. I discuss these flaws in detail in Section IV of this report.

11.   Drs. Harris and Beyer also make inappropriate use in their damages estimates of the results of Dr. Hauser's conjoint study. As described in Sections V and VI of my report, though each uses the data differently, both Dr. Harris and Dr. Beyer misinterpret and misapply Dr. Hauser's data. The conjoint study conducted by Dr. Hauser cannot be used for the purposes Dr. Harris and Dr. Beyer would make of it. The end result, as described in Section II below, is that there is a complete absence of validity in any estimate of RICO damages based on Dr. Hauser's conjoint study.

II.   Taken as a whole, the data and analyses conducted by Drs. Hauser, Harris, and Beyer do not support a determination of RICO damages.

12.   Generally, economists can measure economic damages by comparing the economic position of plaintiffs in the actual world, with the alleged misconduct, compared to a "but for" world in which the challenged conduct did not occur. The difference in the plaintiffs' economic position constitutes economic damages.

13.   Here, plaintiffs' claims essentially are:

a.   The class members believed that the "lights" brands listed in Appendix A to the Second Amended Complaint delivered less tar per cigarette and were less harmful than full-flavored, regular cigarettes;

b.   That the class members' beliefs were a direct result of defendants' use of the descriptor "lights" on the listed brands;

c.   That class members would not have purchased "lights" cigarettes but for their belief, derived from the "lights" descriptor, that "lights" cigarettes were less harmful than full-flavor cigarettes;

d.   That the "lights" brands listed in Appendix A were not actually less harmful to class members, and defendants knew it;

e.   That class members' claims are not otherwise legally barred;

f.   That defendants' use of the "lights" descriptor violates RICO, resulting in damage to class members' business or property [*See, e.g.*, Second Amended Complaint, ¶¶9, 189, 194-195].

14.   Drs. Harris and Beyer attempt, based in part on Dr. Hauser's conjoint study, to calculate the damages owed to class members under RICO. Due to both the inherent invalidity of Dr. Hauser's conjoint study and their own flawed applications of it, Drs. Harris and Beyer fail to make a reliable and scientifically valid estimate.

15.   Dr. Hauser's study does not estimate the proportion of the class during the class period who held the belief that the "lights" cigarette brands listed in Appendix A were less harmful than full-flavored, regular cigarettes. Such an estimate might have been obtained by examining the class members either individually, or by using surveys or

other aggregate data.[1]   Dr. Hauser's conjoint study, however, does not provide this estimate because, among other things, it is not specific to the brands at issue in the case, does not measure beliefs throughout the class period, and cannot be generalized to the class.

16.   Dr. Hauser's conjoint study does not assess the proportion of class members whose beliefs that "lights" brands were less harmful was due to defendants' alleged misconduct in using the descriptor "lights."   To do so, it would have been necessary to consider the effect of defendants' alleged misconduct on the class members' beliefs as compared to all other sources of information about the "lights" descriptor or the relative tar deliveries and health risks of cigarettes yielding less machine-measured tar.   Dr. Hauser's study does not tie "lights" consumers' health beliefs to the "lights" descriptor. The Hauser study cannot rightly be used, as Dr. Beyer does, to show reliance as part of a RICO damages calculation.

17.   Dr. Hauser also does not estimate, for that portion of the class who believed the "lights" brands were less harmful because of defendants' challenged conduct, the proportion of their purchases that would not have occurred but for their defendant-induced beliefs about the health risks of "lights" brands.   Dr. Hauser's study, and Drs. Harris' and Beyer's applications of it, do not purport to quantify the "lights" smokers who would have made different purchase decisions but for defendants' use of "lights" descriptors.

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[1] It would be difficult to design a scientifically reliable survey or other aggregate measure of the nature described in the Court's statute of limitations order. Because such surveys were not undertaken contemporaneously, undertaking a retrospective survey now would lead to results contaminated by people's inability to take themselves back in time. The task is especially hard in terms of establishing annual results for the risk perception measures of interest.

18.   Dr. Hauser's conjoint study does not identify those class members who did not receive a risk reduction from "lights" cigarettes, nor did it determine defendants' preexisting knowledge that a risk reduction would not occur. Dr. Hauser's study does not bear at all on whether class members actually got lower yields and risks, or whether defendants anticipated that would be true.

19.   Neither does Dr. Hauser's study identify those class members whose claims would be somehow barred, such as by the applicable statute of limitations.

20.   Class members who did not believe that the "lights" brands listed in Appendix A were less harmful had no damages. Dr. Hauser's data establish that a substantial number of "lights" smokers did not consider "lights" cigarettes less harmful. In Dr. Hauser's conjoint survey, 38.5% of respondents rated the risk of "lights" as high or higher than the risk of regular cigarettes. In Dr. Hauser's time study, 79.2% of respondents believed that "lights" cigarettes posed the same or higher risk than full flavor cigarettes, and most of those respondents had always held that belief.

21.   Class members who believed that the "lights" brands were less harmful, not because of the "lights" descriptor, but because of what they had been told by their physician, the government, public health authorities, or anyone other than defendants likewise had no damages. Because Dr. Hauser's conjoint study does not tie "lights" risk beliefs to any particular message source, his study cannot support determination of this step of a damages analysis.

22.   Class members who believed that "lights" were less harmful because of the "lights" descriptor but who would have purchased them anyway, even without those

beliefs, also have no damages. They have revealed through their continued "lights" smoking decisions that they value "lights" cigarettes by as much or by more than the purchase price, despite the absence of any reduction in risk. Dr. Hauser's conjoint study has no implications at all for cigarette smokers' decisions.

23.   Class members who in fact received reduced health risk likewise have no damages. Dr. Hauser's conjoint study does not bear on this issue.

24.   The only class members then who might be entitled to damages are those who would not have purchased "lights" cigarettes but for defendants' alleged misrepresentations *and* who did not receive reduced health risk, *and* as a result suffered economic loss to business or property. If the standard is economic loss, the appropriate measure is injury to business or property, not benefit of the bargain, which is the measure used by Dr. Harris. Dr. Hauser's model provides no evidence relevant to this determination, and is inadequate support for Drs. Harris' and Beyer's damages calculations.

III.   Dr. Hauser's conjoint model is not designed to, does not, and cannot measure reliance on "lights" descriptors during the <u>Schwab</u> class period.

25.   Plaintiffs in RICO suits must demonstrate injury to business or property that would not have occurred but for the challenged conduct [*First Nationwide Bank v. Gelt Funding Corp.*, 27 F.3d 763, 769 (2d Cir. 1994)]. If consumers would have continued to purchase "lights" cigarettes if there had been no wrongful conduct, then there are no injuries to property. None of the results presented by Dr. Hauser, Dr. Harris, or Dr. Beyer demonstrates or provides any evidence that any consumer would have stopped or would not have started buying "lights" cigarettes if there had been no wrongful conduct.

26.   Dr. Hauser reports that his conjoint study was conducted to determine whether cigarette health risks influence the purchase of "lights" cigarettes and the extent of such influence. He claims in his "Summary of Conclusions" that the study achieved its purpose: "The results can be relied upon to draw inferences about whether health risks are a significant contributing factor in consumer decisions to smoke 'light' cigarettes and what proportion of 'light' cigarette-smoking consumers relied on health risks as a significant contributing factor" [Hauser Expert Report, Schwab (Dec. 19, 2005) ¶9]. Even if it were methodologically sound, which it is not, Dr. Hauser's conjoint study does none of these things. The study is not directed at and does not reveal information regarding the number of consumers who bought "lights" cigarettes during the class period because of the "lights" descriptor, nor does it show whether any consumers bought "lights" cigarettes due to a belief that "lights" were less risky than regular cigarettes caused by defendants' use of the "lights" descriptor.

27.   First, Dr. Hauser's conjoint model in no way ties consumer beliefs to the "lights" descriptor. The model does not purport to determine the relationship between the "lights" descriptor and risk beliefs. Whatever consumer beliefs exist with regard to "lights" cigarettes, the model does not determine whether they were derived from the "lights" descriptor or some other source. Dr. Hauser admits his conjoint model does not measure the origins of consumer beliefs about "lights" cigarettes [Hauser deposition, Schwab (March 23, 2006) 224:4-7, 225:10-13, 226:17-21]. Dr. Hauser's conjoint model similarly fails to link "lights" smokers' purchase decisions to the "lights" descriptor. Nowhere does Dr. Hauser's conjoint model establish, even in the hypothetical context of his study, that the supposed positive valuation of health is a result of "lights" descriptors.

- 10 -

28.   Not only does Dr. Hauser's survey lack any relevance to "lights" descriptors, it also neglects to ascertain what consumers actually "relied on" in making purchasing decisions. Instead Dr. Hauser merely provides information in the survey and asks survey respondents to rely on the hypothetical cigarette risk hierarchy presented for purposes of valuing cigarette safety. I will discuss in Section IV of my report the implications of this mandatory assumption on the validity of Dr. Hauser's results.

29.   Second, Dr. Hauser's conjoint model is based on hypothetical decisions. It does not measure or use information on actual market choices that people make. It provides no empirical basis for determining why people chose to smoke "lights" cigarettes as opposed to not smoking at all. Dr. Hauser's claims that health risk differences are "a significant contributing factor" to purchase decisions do not correspond to what his conjoint study actually accomplished.   Dr. Hauser's assessment that health risk reductions are positively valued by "lights" consumers is based solely on hypothetical choices independent of existing consumer beliefs, existing consumer products, the existing information environment, and the existing cigarette market. Regardless of the hypothetical nature of the conjoint study, he never shows that a positive valuation of cigarette safety had a significant effect on either the decision to smoke or the type of cigarettes that people smoke.

30.   Third, Dr. Hauser's characterization of health risks being a positive contributing factor to the choice of "lights" cigarettes for 90.1% of "lights" consumers is misleading. Taking all his empirical results at face value, the 90.1% value is not informative of consumers' views with respect to "lights" cigarettes. The 90.1% figure does not compare the valuation of the risks of "lights" cigarettes to regular cigarettes, but rather is derived

from the valuation of risks across a broad spectrum of hypothetical cigarettes, from a product less risky than existing "ultra-lights" cigarettes to a product more risky than existing regular cigarettes. As Dr. Hauser describes his calculation [Hauser Expert Report, Schwab ¶44]: "In the HB CBC analysis, the importance of health risks is the difference between the partworth for 'Health risks are less than an 'ultra-light' cigarette" and 'Health risks are greater than a regular cigarette.' For 90.1 percent of the 627 respondents, this difference was positive..." Dr. Hauser confirmed at deposition that the 90.1% value was calculated in this way [Hauser deposition, Schwab (Mar. 24, 2006) 501:19-23].

31.   Dr. Hauser has done nothing more than demonstrate that 90.1% of survey respondents attach a positive value to moving from one hypothetical risk extreme to another. This result does not indicate that 90.1% of survey respondents value favorably a smaller move in the hypothetical model from a lower risk of "lights" to a greater risk of regular cigarettes. Nor, as I will address below, does this valuation reflect the survey respondents' beliefs as to whether there is a difference in risk between existing "lights" and regular cigarettes.

32.   Fourth, Dr. Hauser's conjoint study is unrelated to the existing risk beliefs of his survey respondents. Dr. Hauser measured how respondents rated the risk of existing "lights" cigarettes in relationship to the risks of regular cigarettes. Thirty-seven percent of respondents to the conjoint study, all of them purportedly "lights" cigarette smokers, rated "lights" as equal in risk to regular cigarettes.[2] Although he measured respondents'

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[2] 79% of respondents to Dr. Hauser's time study considered lights as or more risky than regular cigarettes.

- 12 -

actual risk beliefs, Dr. Hauser makes no use of this information in his conjoint model. Even if the 90.1% positive valuation of health in a hypothetical context were a meaningful value, which it is not, the risk beliefs most respondents brought into the conjoint study from the actual marketplace would not lead to a positive valuation of the risks of "light" cigarettes compared to regular cigarettes.

33.   Fifth, even if Dr. Hauser's conjoint study were properly designed and conducted, the results pertain only to a snap-shot in time. The health risk preferences elicited by the survey and the product "utilities" measured in the conjoint study cannot be extrapolated retrospectively at all, and certainly not to specific years or time periods within the class or statute of limitations periods. The conjoint study survey measures consumer risk preferences regarding the health risks of different types of cigarettes at one point in time-- the date of the survey. Dr. Hauser concedes his conjoint study did not parse out differences in preferences or utilities over time [Hauser deposition, Schwab (Mar. 24, 2006) 343:17-344:4]. As other plaintiffs' experts have acknowledged, consumers' beliefs about lights cigarettes may have changed over time in a manner that would affect their valuation of the health attribute [See, e.g., Dennis deposition, Schwab (July 6, 2006) 361].

34.   The "utilities" yielded by Dr. Hauser's conjoint study—the 90.1% valuation of health risks and the valuation of other product attributes—are no better suited to extrapolation across time. They represent the tradeoffs each survey respondent struck between a restricted list of hypothetical cigarette attributes on a single day in 2005. There is no reason to believe that different respondents, or even the same respondents on a different day, would not have made different tradeoffs.

35.   Sixth, Dr. Hauser's conjoint model is not a reliable indicator of respondents' risk beliefs or the valuation of cigarette "utilities" even on the date of the survey. Many of the methodological flaws addressed in Section IV below pertain to the negative influence of sampling problems and demand artifacts on the reliability and generalizability of Dr. Hauser's results. That these flaws render Dr. Hauser's results unreliable is apparent from a comparison of his measurement of risk beliefs to other surveys' results, and to his time study done later for this case. His survey structure contaminates respondents' risk beliefs, which in turn bias the results of the conjoint analysis.

36.   The available survey data regarding health risk beliefs suggest that far from all smokers or all "lights" smokers believe that "lights cigarettes" are safer than full flavor cigarettes. [*See, e.g.*, National Cancer Institute, Health Information National Trends Survey (2003); N.D. Weinstein and P. Slovic, "Public Understanding of the Risks from Smoking and Opinions about Smoking Control Policies," Unpublished Survey Summary, Rutgers University (2001); National Health Interview Survey (1987)]. Most importantly, the health risk beliefs measured in Dr. Hauser's conjoint study are wildly contradicted by data from Dr. Hauser's own time study. Among respondents to Dr. Hauser's time study, only 14.7% of respondents believed that "lights" cigarettes pose less risk than regular cigarettes, 76.7% believed that they pose the same risk, and 2.5% believe that they pose greater risk.[3] Contrary to Dr. Hauser's claim that 90.1% of respondents place a positive value on cigarettes they are told are less risky, 79.2% of respondents in the time study

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[3] In his Draft Expert Report on his Time Study (Dec. 19, 2005), ¶79, Dr. Hauser reports his results as a percentage of those offering an opinion. I instead report his results as a percentage of the whole sample (N=1026), so that they are comparable to the other survey results I discuss in this report, all of which are reported as a percentage of the whole.

believe that "lights" cigarettes are as risky or more risky than regular cigarettes. The Hauser conjoint analysis fails its own external validity test.

IV. Dr. Hauser's conjoint model suffers from fatal methodological flaws that render it incapable of providing reliable evidence relevant to class-wide, market-based damages.

A. The procedure used to select the sample for Dr. Hauser's conjoint study is biased.

37.   While proper sample selection yields a small sample representative of a larger whole, an improperly selected sample taints all subsequent analyses. The procedures used to generate the survey sample for Dr. Hauser's conjoint study is suspect.

38.   Greenfield Online, the survey vendor used by Dr. Hauser, is an opt-in panel. Dr. Hauser's survey sample consists of individuals who have volunteered online to take surveys for Greenfield Online. This procedure creates biases of unknown direction and falls short of commonly accepted standards for high quality internet-based samples. People who do not currently use computers to access the Internet will not be represented in the sample, leaving out a major population segment. Also the characteristics of a sample derived from people who on their own initiative choose to join a survey panel are likely to be quite different than a random sample of the population in ways that are not well known. This absence of a scientifically sound sampling strategy jeopardizes the credibility of the entire study and undermines the projectability of the sample to the class, rendering the results unreliable.

39.   In situations in which there were too few members of a particular demographic group in particular cells in the Hauser sample group, Greenfield Online filled these cells

in a targeted manner using quotas. This procedure raises two difficulties. First, panel members who chose not to take the survey after being offered the chance to do so will lead to sample selection effects. Dr. Hauser never examines how the overall selection effects bias the estimates and to what extent. Second, insofar as there are differences in selection effects across these various demographic categories, how does the procedure of trying to fill demographic quotas bias the empirical estimates? The answer is unknown, because again, Dr. Hauser never examines the effect of the sample selection bias.

40.   The Greenfield Online completion rate statistic of 94.9% [Hauser Expert Report, Schwab (Aug. 22, 2005) ¶25] is a meaningless measure of the survey response rate. The appropriate measure of the response rate is the product of this .949 figure with the fraction of the Greenfield Online sample who agreed to take the survey, which in turn is multiplied by the fraction of the U.S. population who were contacted at random by Greenfield Online and who agreed to be in the panel. The final component in this calculation does not exist because Greenfield did not contact potential panel members using probability sampling. Instead, it relied on unsolicited Internet volunteers. Any calculation of the overall response rate makes the appropriate measure of the response rate figure very close to zero.

41.   Dr. Hauser potentially could have tested for the effect of the biases induced by sample selection effects, but he undertook no such test. Moreover, because he never reports the characteristics of the people who chose not to respond to the survey after being offered the opportunity to take it, an independent analysis of the sample selection biases induced by Greenfield Online's sampling procedure is not possible.

B.   **The sample of Dr. Hauser's conjoint survey is not representative of the nation or the class.**

42.   All calculations of empirical estimates and confidence intervals are limited to the sample population included in any study. If the population that is sampled is not representative of the class, demographically or of the brands they smoke, then the mean damages values will not be appropriate estimates of the mean damages value for the class.

43.   Similarly, confidence intervals are only tests of 95% confidence ranges for the true parameter value for the underlying population in the sample. If the sample population is not reflective of the class, then one can draw no conclusions regarding whether the true mean diminution value for the class population falls within the estimated confidence interval for the sample.   Neither Dr. Hauser nor Dr. Harris provided any evidence suggesting that the sample population had characteristics parallel to class members. Dr. Hauser's survey therefore provides unreliable estimates for the plaintiff class.

44.   Dr. Hauser's analysis is unrelated to the class of smokers in this case. There was no effort to limit either the Greenfield Online sample or the subsequent data analysis to smokers of the Appendix A brands at issue in this case. Forty-one brands in Appendix A are not represented by even one respondent in his sample, and some brands smoked by respondents in the sample are not included in Appendix A. In fact, some respondents do not smoke a "lights" brand, but instead smoke regular, low tar but not "lights," or "ultra lights" cigarettes. There was also no effort by Greenfield Online or Dr. Hauser to have a

sample that would mirror the market share of Appendix A brands. This failure is particularly important, as some manufacturers may have cigarettes that are viewed quite differently by consumers. Because there is no empirical basis for generalizing Dr. Hauser's study to Appendix A brands, the study cannot support calculations of damages to smokers of these brands.

45.   As noted above, for a survey to provide valid and reliable estimates for a population, the respondents sampled in the survey must be representative of the population to which the researcher wishes to draw inferences. Plaintiffs define the class as lights cigarette smokers nationwide. To provide valid and reliable estimates, Dr. Hauser's sample population must therefore be nationally representative of lights cigarette smokers. The Greenfield Online sample used by Dr. Hauser, however, is not nationally representative, nor is it nationally representative of "lights" smokers. Dr. Hauser made no effort to match the sample demographically to "lights" smokers or even to all smokers. Further, the sample is not nationally representative of the US population without regard to smoking status.

46.   My tests of representativeness will be based on comparisons to the U.S. adult population[4] because Dr. Hauser has never given us a breakdown of the class characteristics. I focus on the four variables for which there are data for at least 500 of the 627 respondents: age, gender, race, and income. There was information on marital status for only 189 respondents, educational attainment for only 169 respondents, and information on employment status for 299 respondents. The fact that the panel

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[4] U. S. Census Bureau. Statistical Abstract of the United States (2005).

information did not include more detailed and more complete demographic information is another signal of the low quality of the Greenfield Online sample. For 37 respondents only age range information is available, while for the remainder there is precise age information (though this age information does not precisely match the data from the categories in the survey question on E5). Using the broader age categories rather than specific ages, the table below provides a summary comparison of the age breakdown of the sample as compared to the U.S. population. Compared to the U.S. adult population, the Greenfield Online sample has 10.6% fewer people age 55 and over, 5.2% more people age 35-44, and 0.4% more people age 18-34.

Table 1: Age: Hauser Sample and 2005 US Adults[5]

Age Range	% of Respondents	% in Adult Population
18-34 years old	36.4%	36.0%
35-54 years old	44.0%	38.8%
55 and older	19.6%	30.2%

47.   As the table below indicates, the sample had a disproportionate share of female respondents, as there are 59% females in the sample as compared to the adult population average of 51.6%. This breakdown is not only unrepresentative of the U.S. adult population, but it is certainly unrepresentative of the class since smoking rates among men are greater than among women.

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[5] *Id.* at Table 12 (2005 data).

Table 2: Gender: Hauser Sample and 2005 US Adults[6]

Gender	% of Respondents	% in Adult Population
Male	41.0%	48.4%
Female	59.0%	51.6%

48.   As the table below indicates, the sample includes 10% more Caucasian respondents than are present in the general population. This sample mix will affect some brands disproportionately, such as menthol cigarettes, which tend to be relatively more popular among African-American smokers. For Newport Lights, a mentholated cigarette, for example, only one of the nine respondents in Dr. Hauser's sample was African-American.

Table 3: Race: Hauser Sample and 2004 US Adults[7]

Race	% of Respondents	% in Population
Caucasian	90.4%	80.4%
African-American	2.1%	12.8%
Other	7.4%	6.8%

49.   For income comparisons I will focus on the 432 Hauser respondents for whom income was reported in fine ranges rather than including the very broad range income information available for the remainder of respondents. The sample is very unrepresentative at the tails of the income distribution. Compared to the general population, the sample included 6.9% fewer respondents in the less than $15,000

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[6] *Id.*
[7] *Id.* at Table 14 (2004 data).

category, 5.7% more respondents in the $15,000-$24,999 category, 8% fewer respondents in the $35,000-$49,999 category, and under-representation in the two income categories for those with incomes of at least $75,000. The table below summarizes the breakdowns.

Table 4: Income: Hauser Sample and 2003 US Adults[8]

Income Range	% of Respondents	% in Population
Less than $15,000	9.0%	15.9%
$15,000 - $24,999	18.8%	13.1%
$25,000 - $34,999	19.9%	11.9%
$35,000 - $49,999	17.1%	15.0%
$50,000 - $74,999	18.1%	18.0%
$75,000 - $99,999	7.4%	11.0%
$100,000 or More	9.7%	15.1%

50.   The importance of a sample that is representative of the class stems from the influence of these demographic factors on Dr. Hauser's estimates of the various partworth values, which in turn will affect the estimates that are used to calculate damages.

51.   Consider the influence of income on the parameter estimates. For the price partworth estimates, income has a statistically significant effect for a 20% premium. Income also has a significant effect on the highest risk parameter estimate. Preferences for risk, taste, and price vary across the population so that a sample that is not representative of the class will generate a biased damages estimate. Dr. Hauser

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[8] *Id.* at Table 676 (2003 data).

. consequently never showed that the results were representative of the class or could be projectable to the class for purposes of assessing damages.

C.   The sample size of Dr. Hauser's conjoint study is too small for scientifically reliable analysis.

52.   Dr. Hauser's survey sample not only suffers fatally from selection bias and lack of representativeness, it also is simply too small. Put somewhat differently, this was not a serious study given the enormous financial stakes in the case.

53.   By way of comparison, national opinion surveys use a sample of 1,200 to be within plus or minus 0.03 in a single proportion at the 95% confidence level. The pertinent sample size needed in tests of proportions depends somewhat on what the proportions are, and in the same vein the pertinent sample size required to make precise judgments in this case varies depending on the variance of the parameter in question.

54.   Standard tests of statistical significance have as their reference point the hypothesis that the hypothesized effect is zero. In the context of a damages analysis, the appropriate matter of interest is not whether the effects are zero, but whether the methodology generates a reasonably precise estimate of the damages value.

55.   Consider the implications of Dr. Hauser's sample size on the damages estimates, setting aside for purposes of this consideration that the damages estimates are completely inappropriate and have no scientific validity. Dr. Harris concludes based on the Hauser study that the 95% confidence range for the mean diminution in value in the "equal to regular" case is 46.8% to 53.5%. That estimate consequently generates a 95% confidence interval that includes a 6.7% variation in the estimate of the true level of the sample

population's mean diminution value. A 6.7% swing in the damages value potentially has huge consequences when the financial stakes involved are as substantial as Drs. Harris and Beyer claim they are in this case. Such wide variation in the damages estimate is, in part, a direct reflection of the small sample size and alone raises significant issues regarding the reliability of the study.

56.   Dr. Harris' confidence interval range in his damages estimate also pertains to calculations of aggregate damages, which assume no differences between smokers of different brands. The confidence interval will be much broader if the data are analyzed by manufacturer or by Appendix A brand rather than in the aggregate for all respondents in the survey. For example, the Hauser sample of 627 respondents includes only nine smokers of Newport Lights, the primary "lights" cigarette products named in this case that is produced by Lorillard. Any calculations of confidence intervals for the mean diminution in value by product manufacturer will lead to considerably more imprecise estimates that cannot be used for a sound damages assessment. For Newport Lights and other brands that are not adequately represented in the sample, there is no reason to believe that the results of Dr. Hauser's study can be used to project damages at all.

57.   In the absence of sensitivity tests by brand, it is not feasible to draw conclusions that will be pertinent to the preferences of the brands sold by the defendants in this case and the specific brands listed in Appendix A.   Dr. Hauser apparently assumes that the influences on purchase decisions of "lights" smokers of different brands cannot be significantly different. Given the significant differences in market share of different brands, that assumption is unreasonable without appropriate empirical data and sensitivity analyses.

58.   Dr. Hauser never presents such a test to show that the conjoint study results are robust across brands. There is no evidence in the materials produced by Dr. Hauser of the tests of brand differences that Dr. Hauser alluded to in his deposition. Unlabelled output suggests that for a limited subsample of what appear to be pretests, there was a test of the difference between Marlboro Lights smokers and the rest of the sample. But there was no similar test report for the full Greenfield Online sample used for the conjoint study.

59.   Dr. Hauser's contrast between Marlboro Lights smokers and other brands as a group does not in fact address the issue of brand differences except perhaps for a single brand. For example, there was no exploration of whether smokers of menthol cigarettes differ from smokers of cigarettes that are not mentholated. There also may be brand loyalty, brand image, or other reasons correlated with differences in taste and the smoking experience delivered by the different brands. None of these differences was examined by Dr. Hauser.

60.   Valuations of taste, risk, and price may differ by brand attributes. Newport Lights is an example of an Appendix A brand with a unique product attribute, mentholation. The limited statistical analysis that is feasible with the small sample of Newport Lights smokers indicates that the preferences of smokers of Newport Lights do differ from the sample as a whole. I have no reason to expect that Newport Lights is the only Appendix A brand whose smokers' preferences depart significantly from the rest of the sample. Had Dr. Hauser's analysis been done correctly, there would have been a sufficiently large sample to do a brand-specific analysis, which in turn could be weighted by the respective

market shares of the brands listed in Appendix A to determine the damages estimate by brand or manufacturer.

61.   The importance of having a sufficiently large sample to analyze brand differences is shown by analyzing the nine Newport Lights smokers. Newport Lights smokers have a smaller mean partworth value for the utility of the risk component of light cigarettes. These coefficients average 11.9 for the nine Newport Lights smokers and 26.3 for the 618 sample members who do not smoke Newport Lights. The differences in the mean coefficients between the Newport Lights smokers and smokers of other brands are statistically significant (t = 2.18 for pertinent test given equal variances). These differences mean the Newport Lights smokers in Dr. Hauser's sample value the health risk level they perceive from lights cigarettes less than do respondents who smoke other brands, which is directly inconsistent with Dr. Hauser's assumption of no significant differences between brands. More importantly, these differences demonstrate that the sample is too small for the results to be generalizable across all brands or to permit the

D.   The structure of Dr. Hauser's survey instrument fatally biases his conjoint study.

62.   The hypothetical risk hierarchy Dr. Hauser used in his conjoint study results in biased risk ratings. Screen shot E15 in Dr. Hauser's conjoint study (Exhibit D to Hauser Expert Report, Schwab (Aug. 22, 2005)) lists risk levels in the following order: greater than regular cigarettes, the same as regular cigarettes, the same as "lights" cigarettes, the same as "ultra-lights" cigarettes, and less than "ultra-lights" cigarettes. Subsequently on screen E19 the survey gives respondents a scale to rate the riskiness of "lights" and "ultra-lights" cigarettes relative to the anchor value for regular cigarettes. The

combination of these two screens will induce a bias in responses that will increase the degree to which respondents will rate "lights" cigarettes as posing lower risk than regular cigarettes. By first rank-ordering the health risks of cigarettes in a linear fashion according to tar category, the survey primes respondents to rate the risks similarly in subsequent questions. That question order and context can affect survey response is recognized both in case law [*See, e.g.,* Reference Manual on Scientific Evidence, 2nd Edition (2000), pp. 254-255] and by Dr. Hauser himself at his deposition [Hauser Deposition, Schwab (Mar. 23, 2006) 165:10-24]. The fact that pretest respondents may not have noted and affirmatively pointed out the priming effects, as Dr. Hauser suggests, does not rule out the likely possibility of such effects.

63.   To the contrary, the extent to which the conjoint study induced a bias in ratings of cigarette riskiness is indicated by a comparison of two surveys Dr. Hauser ran in the Schwab case. Dr. Hauser's conjoint study included the bias-inducing survey screen E15, whereas his time study did not. In the conjoint study, 61.6% of respondents rated "lights" cigarettes as posing less risk than regular cigarettes, 32.7% believe that "lights" cigarettes pose the same risk as regular cigarettes, and 1.3% rate the risk of "lights" cigarettes as greater than regular cigarettes.

64.   The time study survey did not bias respondents with an introductory risk hierarchy slide but instead asked respondents whether "lights" cigarettes have more health risk, the same health risk, or less health risk than regular cigarettes [Hauser Time Study screen E39]. Only 14.7% of respondents believed that "lights" cigarettes posed less risk, 76.7% believed that they posed the same risk, and 2.5% believed that they posed a higher risk. The only respondents who potentially might be pertinent class

- 26 -

members are those who believe that "lights" cigarettes pose a lower risk than regular cigarettes. Comparing these figures, the percentages who rate "light" cigarettes as less risky are 61.6% for the conjoint study and 14.7% for the time study.

65.   These results, both of which Dr. Hauser claims are findings of studies he designed and that met his scientific standards, are strongly contradictory. The extent of the differences indicates that the structure of the conjoint study imposed risk beliefs on respondents that they did not have and, in effect, led respondents to give answers that create valuations in the conjoint study that do not reflect their underlying risk beliefs and preferences. This result alone provides a compelling basis for dismissing the results of the conjoint study that serves as the basis for Dr. Harris' damages estimate.

66.   The subsequent conjoint analysis section of the survey is also biased by this aspect of the conjoint study structure. The second dimension of the conjoint analysis is whether "Health risks are…greater than regular cigarettes, the same as regular cigarettes, the same as light cigarettes, the same as ultra-light cigarettes, and less than ultra-light cigarettes." The wording used on the conjoint analysis screens, such as E22, is consequently identical to the risk hierarchy presented to respondents earlier in the survey on screen E15. The biases created in the rank ordering of cigarette risk beliefs subsequently will contaminate the responses to the conjoint survey questions.

67.   This bias in the conjoint responses would exist given the presence of screen E15 alone, but it is also enhanced by the subsequent instruction before respondents take the conjoint. The survey never asks respondents to rely on their own risk beliefs or perceptions but instead asks them to take the following approach [screen E21]: *"Again,*

- 27 -

you should assume for purposes of this exercise that all of the descriptions, including taste and health risks are as described and that you believe what we say." This instruction will reinforce and exacerbate the biases induced by giving respondents the cigarette risk hierarchy in screen E15. Dr. Hauser asks respondents to assume facts that many do not believe are true. Accordingly, their answers will not reflect their beliefs, but rather the assumptions the survey asked them to make.

E.   Dr. Hauser's estimates of respondents' conjoint utilities for risk are inconsistent with respondents' expressed cigarette risk beliefs.

68.   Dr. Hauser's conjoint respondents' survey answers regarding the riskiness of different cigarettes contradict the values derived from the conjoint portion of the study. The study included two questions about respondents' perceptions of the relative risks of cigarettes before any of the conjoint questions were asked (these questions are shown on page E-19 of Exhibit D to Dr. Hauser's expert report, and their associated data are described as data elements QS5B1 and QS5B2 according to the SPSS Data File Info file provided by Dr. Hauser). According to the answers to these questions, 233 of the 627 respondents assess the risks of "lights" cigarettes to be exactly the same (100%) as the risk of regular cigarettes.

69.   Because Hierarchical Bayes (HB) calculations use information from all respondents to determine values, I performed an HB run only for these 233 respondents, and results from that analysis are compared to the claims made in Dr. Hauser's expert report. Note that the results are very similar whether the analysis is made on a full HB run or an HB run only on the 233, which in itself is problematic because the respondents who do not perceive lower risk values from "lights" cigarettes should have quite different

conjoint estimates. If the conjoint questions reveal preference differences between risk levels for regular and "lights" cigarettes for this group of respondents even though these same respondents have already stated that there are no risk differences, such results would indicate that the conjoint study is not in fact eliciting individual preferences based on their personal risk beliefs.

70.   For this subsample of 233 respondents, the mean utility for regular cigarette risk is negative 2.15, while the main utility for "lights" cigarette risk is 25.42. For these respondents, who rate the risks of the cigarettes as being equal, the two utilities should be equal. However, the utility for "lights" cigarette risk is higher for 204 of these 233 respondents (87.6%) even though they indicated earlier in the survey that these risks are equal. These results suggest that the survey did not elicit preferences but instead created values through the aforementioned biases in the study's structure.

71.   The inconsistency between the stated risk preferences casts doubt on the claims made by Dr. Hauser in his expert report. The discussion here will be limited to the claims in the Hauser report that compare perceived risk for regular cigarettes and perceived risk for "lights" cigarettes. Dr. Hauser states:

> *That is, the average of the partworth for having lower health risks than an "ultra-light" cigarette is statistically significantly larger than the average partworth for having health risks greater than a regular cigarette. This is also true for health risks the same as "light" cigarettes compared to health risks to the same as regular cigarettes [Hauser Expert Report, Schwab, ¶34].*

The sample of respondents who believe that "lights" cigarettes have the same risk as regular cigarettes have a statistically significant difference in their utility partworths between health risks that are the same as "lights" cigarettes compared to health risks that

are the same as regular cigarettes.   Since a significant difference is found where respondents claim there is no difference, the claim about the overall sample is problematic and not reliable.

F.   Dr. Hauser's conjoint study does not accurately reflect the "lights" cigarette marketplace.

72.   The conjoint survey given to respondents did not accurately reflect market choices. The assumption of Dr. Hauser's conjoint model is that cigarette choices are governed by the sum of a set of the utilities of the individual product attributes. If this assumption is satisfied, analyzing a set of four selected attributes in the conjoint study is a reliable approach to ascertaining their incremental influence.   At the heart of this unproven assumption is that consumers value each of the four attributes in Dr. Hauser's model separately, and that adding up the utility of each equates to the overall utility of the product. This additive separability assumption may not hold with respect to real market choices.   Consumer preferences for "lights" cigarettes include many more than four attributes, not the least of which is brand, where these omitted attributes may affect respondents' valuations of the four attributes Dr. Hauser includes in his model.

73.   Dr. Hauser cannot use his results to determine whether smokers would switch to "lights" cigarettes or even switch brands at all because the study included no information on prominent cigarette attributes, such as brand and whether the cigarette is a menthol cigarette. Smokers exhibit substantial brand loyalty. Suppose their chosen brand only comes in a "lights" version. Whereas the survey assumes that they can switch across their cigarette choices costlessly without altering any other cigarette attributes, such as brand, this unrestricted ability to choose fictional products in this manner is simply not feasible for the existing product attribute space available to consumers. If any of the four

attributes that Dr. Hauser included in his survey are associated with an attribute omitted from his survey, such as brand, Dr. Hauser's analysis will produce biased estimates of the attribute that is associated with the omitted attribute. The missing brand attribute may in fact interact with the partworths for the attributes being tested, notably price, risk, and taste. I would expect brand loyalty to dampen the estimated responsiveness to changes in price, risk, and taste. Failure to account for brand consequently creates biases in the empirical estimates obtained from the conjoint analysis of mythical product attribute combinations. In much the same way, missing brand attributes, including, among others, mentholation, cigarette length and circumference, filter color, and package appearance, may bias the estimated partworths. However, there is no way to determine in Dr. Hauser's study the potential effects of such missing attributes.

74.   Dr. Hauser's example [Hauser Expert Report, Schwab (Aug. 22, 2005) ¶12] of how market choices can be simulated shows a fundamental misunderstanding of how the cigarette market operates and a misunderstanding of his study's data. His hypothetical example compared a true "lights" cigarette at the regular price and a cigarette with the risks of a regular cigarette at a 50% reduction in price. His estimate is that the true "lights" would have a market share of 46-48%, with the remainder going to the "lights" cigarette posing the risks of a regular cigarette.

75.   There are four major problems with this hypothetical example. First, these attributes cannot be freely manipulated within brand so that in many instances there are not multiple choices or product risk levels within brand. Second, brand loyalty, which is a factor that is completely ignored in his conjoint study, will reduce the extent of switching away from a "lights" cigarette posing the risk of a regular cigarette if there is

no continuum of cigarette risk choices within brand. Third, the price experiment that he hypothesizes must occur across brands, as cigarettes within the same brand family are priced identically. Finally, Dr. Hauser's analysis understates how reluctant his respondents would be to switch from the risks of "lights" cigarettes to the risks of regular cigarettes because he did not take into account that 38% of the sample viewed the risks of "lights" cigarettes as being equal to or greater than the risks of regular cigarettes.

76. Dr. Hauser's rankings of the importance of different product attributes are arbitrary and meaningless. He ranks the importance of different product features by the difference in the maximum and minimum partworth for the feature [Hauser Expert Report, Schwab, ¶ 46]. However, the importance of any feature will be governed by the range of values for that feature included in the conjoint study. A conjoint study in which the price of cigarettes might increase by 100%, which is well within the range of U.S. product price variation, will yield a larger utility spread than will be found in a conjoint study in which the product price can only increase by at most 50%, as in his study. At a more fundamental level, it is neither feasible nor sensible to make an economic determination of the absolute importance of different product dimensions.

77. Dr. Hauser's analysis does not accurately reflect the "lights" marketplace because it does not consider the tar and nicotine information companies are required to provide. Dr. Hauser's survey does not provide respondents with the tar and nicotine ratings that cigarette companies are required to include in their advertising. Indeed, in his deposition, Dr. Hauser was unaware of these requirements [Hauser deposition, Schwab (Mar. 23, 2006) 66:21-23]. Dr. Hauser's conjoint study provides respondents with the relative risk hierarchy of cigarettes in screen E15, but this hierarchical ranking is not currently

included in any cigarette advertising or public statements. A properly designed survey should capture the consumer's informational environment. In Dr. Hauser's study, however, informational structure and the product characteristic choices do not mirror reality.

G. Constraints imposed by Drs. Hauser and Harris are inappropriate and bias their estimates of willingness to pay and damages estimates.

78. Drs. Hauser and Harris base their opinions not on the unfiltered preferences offered by respondents, but instead on constrained data. Their estimations force coefficients to be plausible, instead of allowing the estimates to reflect respondents' stated preferences, which sometimes violated basic principles of economic rationality. Drs. Harris and Hauser impose two sets of constraints on their empirical results. Dr. Hauser's empirical estimation imposes the constraint that the product price coefficients have the expected sign that accords with economic theory, which in this instance is that a lower price is preferred over a higher price. However, it is never appropriate in econometric analyses to constrain the signs of regression coefficients. Doing so changes the statistical implications of respondents' answers, which undermines all of the desirable statistical properties of the estimators that are used.

79. Dr. Hauser constrained the price utility partworth parameters to have a negative value, such that higher prices resulted in lower utility, even though the unconstrained estimates actually given by survey respondents were often wrong-signed, or positive. Moreover, within the gradations of price changes, the Hauser estimation imposed the constraints that larger price increases were no more desirable than smaller increases, and that larger price decreases were no less desirable than smaller decreases.

80.   In addition to Dr. Hauser's constraint on the estimation, after the results were obtained Dr. Harris imposed a constraint that the risk coefficients had to have the sign in accordance with economic theory, or else the coefficients would be set equal to zero. Thus, Dr. Harris is disregarding Dr. Hauser's risk coefficient estimates whenever they are negative, and he is arbitrarily setting these values equal to zero. Even after imposing this constraint on the risk coefficients, the results are sometimes nonsensical in ways that cast doubt on the survey's validity. Dr. Harris consequently imposed a second constraint that damages cannot exceed the product price. The end result is that Dr. Harris bases his analysis not on the implications of the data, but instead manipulates the data to generate a favorable damages estimate.

81.   Because the price-risk calculation of the loss from the higher risk of "fake lights" is given by the utility difference in risk levels divided by the utility difference in prices, the effect of this constraint imposed on the estimated parameters in some instances is to make the denominator of this calculation zero. Dividing the utility difference in risk levels by the utility difference in price levels that is zero makes the utility loss from a risk increase in cigarettes infinite, as discussed by Dr. Harris [Harris Expert Report, Schwab (Sept. 6, 2005) ¶13]. Whenever these types of nonsensical results arose, Dr. Harris capped the damages amount at 100% of the price. But for consumers who have the same utility irrespective of the price level, why is there any basis for any damages award, much less an award equal to the full product price?

82.   Dr. Hauser's imposition of constraints also varied by brand. Newport Lights can again serve as an example. Among the entire sample, Dr. Hauser constrained at least one cost coefficient for 42% of respondents. Constraints were applied to a much higher

- 34 -

proportion of Newport Lights smokers. Among Newport Lights smokers specifically, seven of nine respondents were constrained on price. That 78% of Newport Lights smokers in the sample were constrained by Dr. Hauser in reporting his results suggests Dr. Hauser's model does not capture the differences among brands in smokers' preferences.

83.   Together, Drs. Hauser and Harris impose constraints on the two key empirical results that are the central components of the damages calculation—the partworths for cigarette riskiness and the partworths for product price. In each instance, the constraints that they impose serve to boost the estimated damages, as discussed in Section V below. These arbitrary alterations have no sound basis in economic analysis and are not founded in science.

H.   Dr. Hauser's conjoint study does not provide a scientifically valid and reliable estimate of consumers' willingness to pay for a "lights" cigarette that is less risky than a regular cigarette.

84.   Replication and reanalysis of Dr. Hauser's willingness-to-pay and market-based valuations show clear inconsistencies that undermine the reliability of Dr. Hauser's estimates. Dr. Hauser's constraint of cost coefficients inflates both the willingness-to-pay and market-based values. Consideration of the statistical implications of respondents' stated risk preferences, which Dr. Hauser's analysis fails to do, highlights the fact that Dr. Hauser's study produces both inconsistent responses and variable willingness-to-pay estimates, which renders the results unreliable.

85.   A replication of Dr. Hauser's analysis produced further evidence of inconsistencies with respect to the claims Dr. Hauser made in his expert report. Slight

differences between the results can be expected, since my replication used a Hierarchical Bayes (HB) analysis with 20,000 iterations instead of the 12,000 iterations that Dr. Hauser used. However, the more precise estimates that result from using more iterations should not make any substantial difference if the utility parameters reached a stable point in the Hierarchical Bayes estimation. The existence of inconsistencies in this analysis as compared to Dr. Hauser's suggests that either the estimates are not stable or the description of Dr. Hauser's tests is not in line with our interpretation of these tests.

86.   Analysis of Dr. Hauser's conjoint data makes clear the influence of prior risk beliefs on willingness to pay to attain the risk associated with "lights" cigarettes. Though Dr. Hauser does not note it in his expert report, the effect on the estimated damages values of using the conjoint results that include the respondents who did not rate "lights" cigarettes as being riskier than regular cigarettes is substantial.

87.   In ¶ 48 of his Schwab expert report, Dr. Hauser calculates the median willingness to pay as equal to 47.3. If the 233 respondents who rated "lights" cigarettes as being equal to regulars are assigned a willingness-to-pay value of zero, which comports with economic rationality and their expressed risk beliefs, the willingness to pay of the median respondent drops to 11.87. If the additional eight respondents who rate "lights" cigarettes as being more risky than regular cigarettes have their willingness to pay set to zero, the median willingness to pay drops to 9.59. The median willingness-to-pay amount is then

one-fifth of the amount estimated by Dr. Hauser if the results of his survey's risk perception questions are taken into account.[9]

88.   Dr. Hauser's analysis greatly overstates the conjoint study's implications for the willingness to pay for a lower risk cigarette when his constraints are considered. Dr. Hauser states his key results as follows:

> *When partworths vary by respondent (heterogeneous respondents), the median willingness-to-pay can either increase or decrease relative to this hypothetical situation. When I complete this calculation for each respondent and take the median across respondents, I calculate a median willingness-to-pay of 47.3 percent [Hauser Expert Report, Schwab, ¶48].*

89.   The constraints imposed by Dr. Hauser are not minor statistical details but are fundamental errors that substantially increase the damages estimates. After reproducing this analysis without constraints, the median willingness to pay to go from a cigarette with regular cigarette health risks to one with respondents' perceived "lights" cigarette risks was found to be 25.5%. Dr. Hauser's run that constrains the sign of the estimated cost parameters almost doubles the damages estimate to 47.3%.[10]

90.   Further, there was no apparent basis for the following claim by Dr. Hauser regarding consumers' willingness to pay for lower health risks.

> *I estimate that more than 75 percent of the consumers would be willing to pay more than 50 percent of the price per pack of their cigarettes to decrease health risks from greater than regular*

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[9] Dr. Hauser's market-based estimates of the value of the risks of "lights" cigarettes compared to regular cigarettes are similarly inconsistent with respondents' expressed risk beliefs for these cigarettes.

[10] Reproducing Dr. Hauser's approach constraining the cost parameters produced a 44.01% median.

cigarettes to health risks the same as "light" cigarettes [Hauser Expert Report, Schwab, ¶60].

After reproducing this analysis, no basis for this estimate could be found, but the estimates in any event are meaningless because of the major structural flaws discussed above.

91.   Finally, willingness to pay, as determined by Dr. Hauser, also varies significantly by brand. Using again the example of Newport Lights, Dr. Hauser's willingness-to-pay analysis [Hauser Expert Report, Schwab, ¶48] differs for Newport Lights smokers as compared to smokers of other cigarettes. The mean willingness-to-pay estimate is 5.7 for Newport Lights smokers and 191.0 for the remainder of the sample. These values are significantly different at the 95% level ($t = 2.60$ for appropriate test when variances are unequal). The enormous difference in willingness to pay between Newport Lights and the other brands included in the study demonstrates that the conjoint study is not generalizable across all "lights" brands and that there is no scientific validity for the claim that all "lights" brands' smokers have the same willingness to pay for the risk associated with "lights" cigarettes.

I.   The inconsistent and irrational estimated utility partworths demonstrate the invalidity of Dr. Hauser's conjoint study.

92.   Studies of stated preferences, of which Dr. Hauser's study is an example, rely upon hypothetical choices, not real market behavior. To be confident in the results of any study of stated preferences, one must first verify that respondents' expressed preferences pass basic tests of rationality. Dr. Hauser's conjoint study fails this criterion. Conjoint study respondents were unable to translate their preferences into utilities by answering the conjoint questions. Large portions of the sample had conjoint utilities for features

that were not rational, as less risk was often not associated with greater utility, and less cost was often not associated with greater utility. In addition, many respondents revealed preferences regarding pack, taste, or risk in early non-conjoint survey questions that did not translate into conjoint utilities consistent with those stated preferences.

93. The estimated utility partworths reported by Dr. Hauser did not follow a rational and consistent pattern. Respondents should exhibit a higher utility as the price of the product declines or the risk of the cigarettes declines. Most respondents exhibit one or more irrational responses. Pack type and taste are not considered here because there is no rational order for those features.

94. The failure of the utility partworths to follow a logical pattern for those attributes for which there is a rational ranking serves as a test of the overall validity of the conjoint study. If a large number of respondents give irrational responses, as is the case with Dr. Hauser's survey, that result suggests that the respondents either did not attend adequately to the survey task or the survey itself was flawed in a fundamental way.

95. Consider first the utility values assigned to the risk attributes. The highest utility value should be accorded to the lowest risk, with decreasing utility values as the risk level increases. Overall, 337 respondents (53.7%) failed at least one diminishing conjoint utility test for risk, and some failed more than one test. Specifically, 82 respondents (13%) did not associate the lowest utility partworth with the highest risk, and 127 (20%) had a higher utility partworth value for the regular cigarette risk compared to the lowest risk level. Also, 282 respondents (45%) had a higher estimated utility for the risk of "lights" cigarettes compared to that of "less-than-ultra-lights." Finally, 197 respondents

(31%) had a higher utility for "ultra-lights" risks compared to "less-than-ultra-lights" risks.

96.   Other irrational utilities for cigarette risks included 42 respondents (6.7%) who had a positive utility value for the highest risk cigarette and 97 respondents (15.5%) who had a negative utility value for the lowest risk cigarette. The following table summarizes the percentage of the respondents who exhibit the different inconsistent patterns for the utility of the cigarette risk attribute.

Table 5: Inconsistent Health Risk Utilities

Health Risk Category For Cigarette	Respondent Has Higher Utility for This Feature Than Less-Than-Ultra	Respondent Has Lower Utility for This Feature Than Greater-Than-Regular	Respondent Does Not Have Highest / Lowest Utility for This Feature
Greater than regular	10%	-	13%
Same as regular	20%	7%	-
Same as "lights"	45%	5%	-
Same as "ultra-lights"	31%	9%	-
Less than "ultra-lights"	-	10%	53%

97.   There are also inconsistencies in the pattern of utilities for the cost components. As the cost level increases, the utility parameter value should decline. Dr. Hauser's data analysis used for his report did not allow for this analysis of the consistency of the cost utilities, because cost utility was constrained to fall as cost rose for every respondent. This aspect of his study was never disclosed in his expert report.

98.   If this constraint is not imposed, 266 respondents (42.4%) failed at least one increasing conjoint utility test for cost. The distribution of these violations was as follows: 94 respondents (15%) did not have the lowest utility associated with the highest

cost, 49 respondents (8%) preferred the 20% higher cost level to at least one lower cost level, 159 (25%) preferred paying what they pay now instead of lower cost levels, and 105 respondents (17%) preferred 20% lower cost to the lowest cost level. The table below summarizes the inconsistencies in the partworths for the different cost levels.

Table 6: Inconsistent Cost Utilities

Cost Category For Cigarette	Respondent Has Greater Utility Than for A Lesser Cost Option	Respondent Has Lesser Utility Than for A Greater Cost Option
50% More	15%	–
20 % More	8%	13%
Same As Now	25%	7%
20 % Less	17%	25%
50 % Less	–	22%

J.   Inconsistent estimated utilities and expressed preferences for the same product attributes further demonstrate the Hauser model's invalidity.

99.   The survey instrument included a series of questions that permit a comparison between respondents' directly expressed preferences regarding product characteristics and the estimated utilities for these same attributes based on the conjoint study. If the study design is sound, the expressed preferences should be mirrored in the estimated utilities. For example, if a smoker indicates a preference for a hard pack rather than a soft pack, that same ranking should be reflected in the estimated utility partworths. The estimated partworths fail this consistency test for a large number of respondents for each of the dimensions on which the survey asked respondents directly about their preferences: risk, taste, and pack type.

100.   I examined five opportunities for a respondent in Dr. Hauser's conjoint study to demonstrate inconsistent or irrational responses:

- Irrationality within cost utilities with unconstrained utility parameters;
- Irrationality within risk utilities;
- Inconsistency translating pack preference into utility;
- Inconsistency translating taste preference into utility;
- Inconsistency translating risk preference into utility.

101.   One or more of these inconsistencies was evident for almost all respondents. As shown in the table below, only 24 people (3.8%) avoided all of these problems. The remaining 603 respondents had at least one problem, and over half of the sample--339 respondents-- had rationality violations in three or more of the areas mentioned above. This summary of problems does not include respondents who claimed equal risk for cigarette types but did not have equal conjoint utilities. Including those inconsistencies as well would increase the number of problems among respondents and reduce the number of respondents who did not exhibit any problems to eleven.

Table 7: Respondents Answering Inconsistently

Number of Problems	Number of Respondents	Percentage
None	24	3.8%
1	86	13.7%
2	178	28.4%
3	201	32.1%
4	119	19.0%
5	19	3.0%

102.   The comparison of the estimated pack type utilities to respondents' direct expression of their pack type preferences is possible using the following survey question (in question E-18 according to Exhibit D to Hauser Expert Report, variable QS5A): "If your regular brand of light cigarettes were offered in both hard and soft packs, which type of pack would you choose?"

103.   The same respondents who indicate a preference for a hard pack also should have a higher utility value for hard packs based on the conjoint analysis. The responses fail this test for about one-third of the respondents. In total, 193 respondents (31%) have estimated conjoint utilities that do not match their stated preference from question E-18.

104.   Whereas in the direct preference question, 503 respondents (80%) answered that they would prefer a hard pack, the estimated utilities based on the conjoint questions indicate that only 424 respondents (68%) prefer a hard pack. Many respondents exhibit a preference reversal for what should be a quite simple choice, as 57 respondents (9%) who claim to prefer soft pack exhibit greater utility values for hard pack, and 136 respondents (22%) who indicate a preference for hard pack have a greater conjoint utility for soft pack. The table below summarizes these results.

Table 8: Preference Reversals for Pack Preferences

Preference	E-18 Question	Conjoint Questions	Switch from E-18 to Conjoint
Hard Pack	80%	68%	22%
Soft Pack	20%	32%	9%

105.   Overall, almost a third of respondents have conjoint utilities that contradict their stated preferences for pack type. Pack type is the simplest of the product attributes in the conjoint analysis, as it can only have two different values—hard pack and soft pack. Such a high rate of failure in the correspondence between conjoint utilities and stated preference casts doubt on whether the conjoint analysis is in fact reflecting consumer preferences.

106.   It is possible to compare the taste preference partworths to the direct expressions for cigarette taste using the survey questions that ask respondents in question E-20 to compare the taste of their brand of "lights" cigarette to the taste of "ultra-lights" cigarettes (variable QS5C1) and to the taste of regular cigarettes (variable QS5C2). The survey asks respondents to quantify their taste preference relative to a base score of 100 representing their brand of "lights" cigarettes. Any value below 100 for "ultra-lights" or regular cigarettes indicates a preference for their current brand of "lights" cigarettes in terms of taste. Values above 100 indicate that respondents prefer the taste of regular (or "ultra-lights" for QS5C1) cigarettes.

107.   Consider first the taste of "lights" cigarettes compared to "ultra-lights." In the direct expressions of preferences, 78 respondents (12.4%) indicate a preference for the taste of "ultra-lights" to "lights." However, 71 of these 78 respondents have higher conjoint utility values for the taste of "lights" cigarettes than for "ultra-lights." Similarly, 410 respondents (65.4%) indicate a direct preference for the taste of "lights" compared to "ultra-lights." However, 32 of these respondents have higher conjoint utility values for "ultra-lights" cigarettes than "lights."

108.   In the direct preference questions, 139 respondents (22.2%) indicate that "lights" and "ultra-lights" are equivalent with respect to taste, but none of this group has an equal conjoint utility for "lights" and "ultra-lights." Based on the conjoint responses, twelve have higher conjoint utility for "ultra-lights" taste, 127 have higher conjoint utility for "lights" taste, and none have equal utility values consistent with their direct expression of preference. The expressed taste preferences and the implied conjoint utility results are summarized in the table below.

- 44 -

Table 9: Preference Reversals for Taste Preferences for "Lights" vs. "Ultra Lights"

	E-20, "Lights" Taste Vs. "Ultra-Lights" Taste	Number of Column 1 Who Switch Preference In Conjoint Utilities
"Lights" Taste Better	410	32 (8%)
"Ultra-Lights" Better	78	71 (91%)
Taste The Same	139	139 (100%)

109.   The comparison of the direct expressions of preference and the conjoint utilities for the taste of "lights" and regular cigarettes display similar inconsistencies. While twelve respondents (1.9%) indicate a direct preference for the taste of regular cigarettes to "lights," eleven of these respondents have higher conjoint utility values for "lights" cigarette taste.

110.   Overall, when asked directly about their preferences, 566 respondents (90.2%) indicate a preference for the taste of "light cigarettes" over regulars. This result is of fundamental importance to the litigation in that it indicates the fundamental role of taste in accounting for smokers' choice of "lights" cigarettes. It suggests that even if class members value health risks, they also value taste, so that even if a class member were deceived, the class member might still have purchased lights but for the alleged deception.

111.   The conjoint estimates are sometimes inconsistent, as 73 of the respondents who indicate a preference for the taste of "lights" cigarettes have higher estimated conjoint utility values for regular taste. Similarly, 49 respondents (7.8% of the sample) who indicate in the direct preference questions that regular cigarettes and "lights" taste the same do not have equal utilities from the conjoint responses, as 13 have higher conjoint

utility values for regular taste, and 36 have higher conjoint utility for "lights" taste. The table below summarizes the results for "lights" taste vs. regular taste.

Table 10: Preference Reversals for Taste Preferences for "Lights" vs. Regulars

	E-20, "Lights" Taste Vs. Regular Taste	Number of Column 1 Who Switch Preference In Conjoint Utilities
"Lights" Taste Better	566	73 (13%)
Regulars Taste Better	12	11 (92%)
Taste The Same	49	49 (100%)

112.   The taste preference questions for the non-adjacent categories of regular and "ultra-lights" cigarettes can be linked together to determine whether respondents' taste preferences obey the expected transitivity as compared to the middle category "lights." In a properly designed conjoint study, one would expect not only consistency between respondents' expressed taste preferences and their taste utilities, but also that expressed taste preferences for each tar category make sense in relationship to the anchor product "lights" cigarettes. The latter is the "expected transitivity." To see how the answers to the two early direct preference questions can be used in a transitive manner to compare respondents' beliefs about the relative taste of regular cigarettes and "ultra-lights" cigarettes, consider the following example. If regular cigarettes have 50% of the taste of "lights," and "ultra-lights" have 75% of the taste of "lights" on the linear taste scale considered by respondents, one can determine that "ultra-lights" taste is preferred to the taste of regulars.

113.   Using the direct preference questions in this manner, 119 respondents (20%) prefer the taste of regular cigarettes to "ultra-lights." However, 71 of these respondents

have higher conjoint utility values for "ultra-lights" taste. Most respondents had the opposite direct preferences between regular and "ultra-lights" cigarettes, as 391 respondents (62.4%) prefer the taste of "ultra-lights" to regular. However, 308 of these 391 respondents have higher conjoint utility values for regular cigarettes. There were also 117 respondents (18.7%) whose direct preferences indicated that regular and "ultra-lights" are equivalent in terms of taste, but none of these respondents had equal conjoint utilities, as 75 have higher conjoint utility for regular taste, and 42 have higher conjoint utility for "ultra-lights" taste. The table below summarizes the results for regular taste vs. "ultra-lights" taste.

Table 11: Linked Preference Reversals for Taste of Regulars vs. "Ultra Lights"

	E-20, Regular Taste Vs. "Ultra-Lights" Taste	Number of Column 1 Who Switch Preference In Conjoint Utilities
Regulars Taste Better	119	71 (60%)
"Ultra-Lights" Taste Better	391	308 (79%)
Taste The Same	117	117 (100%)

114.   A large majority (67%) of respondents expressed at least one taste preference that was not reflected in their conjoint utilities.   Including respondents whose direct expression of indifference became an estimated conjoint preference, then a vast majority (89%) of respondents have conjoint utilities for taste that are inconsistent with their directly expressed preferences.   Overall, the utilities produced from the conjoint questions do an extremely poor job of reflecting respondents' stated beliefs about their taste preferences.

115.   The conjoint utility estimates for the risk values can be compared to the direct expressions of risk preference using survey question E-19, which asks respondents to compare their perception of the relative risks of regular cigarettes to those of "lights" cigarettes (in question QS5B1) and to those of "ultra-lights" cigarettes (in question QS5B2).

116.   Consider first the comparison of the risk of "lights" cigarettes to regular cigarettes. While eight respondents (1.3%) directly ranked the risk of regular cigarettes below that of "lights," seven of these respondents had higher conjoint utility values for the risk of "lights" cigarettes than for the risk of regular cigarettes.   For the 386 respondents (61.6%) whose direct risk ranking was that "lights" cigarettes have less risk than regulars, 37 had higher conjoint utility values for regular cigarettes.

117.   The final direct risk ranking category was the 233 respondents (37.2%) who directly ranked the risk of "lights" cigarettes and regular cigarettes as being equal. But they do not have equal conjoint utilities from the conjoint responses, as 211 have higher conjoint utility for "lights" risk, and 22 have higher conjoint utility for regular risk. The table below summarizes the results for "light risks" vs. regular risk.

Table 12: Preference Reversals for Risk Preferences for "Lights" vs. Regulars

	E-19, "Lights" Risk Vs. Regular Risk	Number of Column 1 Who Switch Preference In Conjoint Utilities
"Lights" Less Risky	386	37 (10%)
Regulars Less Risky	8	7 (88%)
Same Amount of Risk	233	233 (100%)

118.   It is possible to analyze the risk rankings of "ultra-lights" cigarettes and regulars similarly. In the direct risk ranking, twelve respondents (1.9%) indicated that regular cigarettes have less risk than "ultra-lights," but seven of these respondents have higher conjoint utility values for the risk component of "ultra-lights" cigarettes. Over half of the sample, or 397 respondents (63.3%) directly rate the risk of "ultra-lights" cigarettes as being lower than that of regulars.

119.   Despite this direct rating, 73 of these respondents have higher conjoint utility values for the risk of regular cigarettes compared to "ultra-lights." For the 218 respondents (34.8%) who rate the risk of "ultra-lights" cigarettes and regular cigarettes as being the same, none have equal estimated conjoint utilities: 164 have higher conjoint utility for "ultra-lights" risk, and 54 have higher conjoint utility for regular risk. The table below summarizes the results for "ultra-lights" risk vs. regular risk.

Table 13: Preference Reversals for Risk Preferences for "Ultra-Lights" vs. Regulars

	E-19, "Ultra-Lights" Risk Vs. Regular Risk	Number of Column 1 Who Switch Preference In Conjoint Utilities
"Ultra-Lights" Less Risky	397	73 (18%)
Regulars Less Risky	12	7 (58%)
Same Amount of Risk	218	218 (100%)

120.   By linking together the results of Dr. Hauser's questions about the risks of regular and "ultra lights" cigarettes, it is possible to compare the degree to which the non-adjacent categories of regular cigarettes and "ultra-lights" cigarettes have consistent risk preferences. Consider first the direct risk ratings, which are straightforward expressions of risk of different cigarette types on a linear scale. Only 18 respondents (2.9%) rate the

risk of "lights" cigarettes as being lower than that of "ultra-lights." Of this group, nine respondents have higher conjoint utility values for "ultra-lights."

121.   Just over half the sample, or 330 respondents (52.6%), rate the risk of "ultra-lights" cigarettes as being lower than that of "lights." For that group who rates "ultra-lights" as having lower risk, 182 of these respondents (55.2%) have a higher conjoint utility value for the risk component of "lights" cigarettes according to the conjoint responses. In many instances, respondents gave equal risk ratings to "lights" and "ultra-lights" cigarettes, as 279 respondents (44.5%) rate the risk of "lights" cigarettes to be the same as "ultra-lights," but they do not have equal conjoint utilities: 177 (63.4%) have higher conjoint utility for "lights" risk, and 102 (36.6%) have higher conjoint utility for "ultra-lights" risk. The table below summarizes the results for the comparisons of "lights" risk vs. "ultra-lights" risk.

Table 14: Linked Preference Reversals for Risk of "Ultra Lights" vs. Regulars

	E-19, "Ultra-Lights" Risk Vs. Regular Risk	Number of Column 1 Who Switch Preference In Conjoint Utilities
"Ultra-Lights" Less Risky	330	182 (55%)
"Lights" Less Risky	18	9 (50%)
Same Amount of Risk	279	279 (100%)

A majority of respondents (63%) who expressed a risk preference between "lights" and "ultra-lights" did not have conjoint utility values consistent with these expressed preferences. Including respondents whose directly expressed indifference is accompanied by an estimated conjoint preference, a vast majority (78%) of respondents exhibit conjoint risk preferences that contradict their stated risk preferences.

122.   Analyzing the source of the shortcomings in the conjoint study is not feasible because Dr. Hauser failed to adhere to good survey practice by including questions at the end of the survey to enable respondents to identify problems that they encountered. There is no evidence of any debriefing of respondents after the survey, making it difficult to determine whether the failure of the survey was due to the difficulty of the survey task for respondents (confusion, fatigue, lack of interest), a battery of conjoint questions that could not accurately map responses to respondent utility (too few questions, poor distribution of attributes across questions), features of the survey that at least implicitly seek to manipulate the conjoint responses by, for example, the use of risk attribute names that imply a risk hierarchy, or implementation problems associated with using the Greenfield Online sample. Irrespective of the cause of the difficulties, Dr. Hauser's survey does not meet scientific standards.

V.   Dr. Harris' damages model, based in part on Dr. Hauser's conjoint study, also fails to provide a valid estimate of RICO damages.

A.   Dr. Harris' loss of value concept measures benefit-of-the-bargain, not injury to business or property.

123.   The damages concept that Dr. Harris uses is what he calls "diminution in value" or "loss of value." Irrespective of what he calls his damages concept, it does not meet the criteria for being an appropriate measure of injury to property. The mismatch of Dr. Harris's damages concept to the pertinent damages principles in this case is reflected in Dr. Harris' claim that both the Knowledge Networks survey conducted by Dr. Dennis and the conjoint analysis by Dr. Hauser are both appropriate measures of damages. [Harris Expert Report, Schwab (Feb. 28, 2005), ¶15; Harris deposition, Schwab (March 9, 2006), 434:1-4].

124.   Dr. Harris also uses damages values from the same Knowledge Networks survey designed by Dr. Dennis for <u>Price v. Philip Morris et al.</u>, where the damages concept was benefit of the bargain.[11]   Dr. Harris thus equates the benefit of the bargain approach in <u>Price</u> to the injury to business or property concept that is appropriate in <u>Schwab</u>. Loss of property is not the same as benefit of the bargain. If Dr. Dennis' results are a measure of benefit of the bargain and the conjoint analysis by Dr. Hauser is equivalent to the <u>Price</u> case approach, then what Dr. Harris is measuring in every instance is damages based on the benefit of the bargain.

125.   Dr. Harris is correct in his claim that both the Dennis Knowledge Networks survey and the Hauser conjoint analysis are alternative approaches to measuring the same economic magnitudes [Harris deposition, <u>Schwab</u> (June 7, 2005) 38-41]. Putting aside specific reservations I have with respect to each of these approaches, consider what these studies set out to do and why they are unrelated to injury to property. The Dennis Knowledge Networks survey uses willingness-to-pay questions to determine the price-risk tradeoff that smokers exhibit based on the discount they require to purchase "fake lights" cigarettes in a world in which "true lights" are available. The Hauser study uses conjoint analysis purportedly to determine the price-risk tradeoff that smokers are willing to make if the cigarette risk is increased based on their responses to hypothetical choices across four product dimensions.

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[11] As part of my work as an expert witness in <u>Price</u> and <u>Turner</u>, I examined data from the Knowledge Networks survey produced by Dr. Dennis. My opinions on the Knowledge Networks survey are clearly stated in my expert reports in those cases, which I incorporate by reference.

126.   Although the survey approaches differ, the empirical magnitude being measured by these studies is the same, as each study estimates the price-risk tradeoff based on subjective responses to survey questions. Dr. Harris uses the estimated price-risk tradeoff to calculate the dollar value that smokers need to receive to obtain the same level of utility that they would have experienced if the light cigarettes had been "true lights" cigarettes from a risk standpoint.

127.   Dr. Harris' damages calculation is not a measure of loss of property but rather a measure of loss of utility based on subjective valuations of the utility of the product attributes. His damages value includes possible loss in consumer surplus, i.e., the amount the consumer would have been willing to spend on the cigarettes above their market price.

128.   Moreover, people who would have continued to purchase "fake lights" cigarettes after learning of the true properties of "lights" cigarettes may continue to purchase those cigarettes and consequently have suffered no loss of property. Consider the following example. The consumer values "true lights" cigarettes at $8 a pack, "fake lights" cigarettes at $6 a pack, and pays a current market price of $5 a pack. Under Dr. Harris' damages approach based on price-risk tradeoffs, this consumer of "fake lights" is entitled to $2 per pack in damages. However, even after learning that "lights" cigarettes are "fake lights," this consumer will continue to purchase the cigarettes because the consumer's willingness to pay for the cigarettes of $6 exceeds the market price of $5. Thus, in this example, there is no change in the purchases consumers make and no loss of property, but nevertheless Dr. Harris's methodology will lead to an estimate of $2 per pack in damages.

129.   Dr. Harris' calculations of damages under his loss of value approach are incorrect and inconsistent with the method that he has claimed is correct. Dr. Harris articulates his loss of value approach as "the difference between the price paid for the good as represented and the value of the good that is actually sold" [Harris Expert Report, Schwab (Feb. 28, 2005) ¶11]. In Price, I advocated that definition as a measure of benefit of the bargain, not as a measure of loss of property [Viscusi Expert Report, Price (Jan. 6, 2003) ¶ 8]. Dr. Harris' definition of the loss of value differs from the methodology that Dr. Harris actually used in that case and which he is also using in Schwab, contradicting his claim that this approach is what he used in Price [Harris Expert Report, Schwab (Feb. 28, 2005) ¶12].

130.   Moreover, the loss of value damages amount that Dr. Harris calculates in Schwab does not meet his own definition of how it should be computed. Dr. Harris' responses to the following example from his March 10, 2006 deposition in Schwab make Dr. Harris' errors clear. The price per pack is $5. Consumers value "lights" cigarettes at $7 per pack, consisting of the health benefit value to the consumer of $4 and valuation of the other attributes of the cigarette at $3. In the deposition, Dr. Harris stated that the value of damages in this instance would be the product price, $5. However, in terms of his definition of the loss of value, the damages should equal the difference between the price paid for the good, which is $5, and the value of the good that is actually sold, which is $3, resulting in only $2 in damages [Harris deposition, Schwab (March 10, 2006) 592].

131.   Dr. Harris erred in two ways. First, the calculations performed by Dr. Harris are inconsistent with the damages principles that he states are the correct measure of his "loss of value" concept. The correct answer given his formula should have been $2 not $5.

- 54 -

Second, his response to how his damages approach would have handled this example contradicts the methodology used in his actual calculation of damages in the <u>Schwab</u> case. His damages calculations generate numbers based on the amount of money consumers need to have the same level of utility as they would have with "true lights," which in this instance is $4. This $4 damages amount is not the $5 he stated was the correct damages value in his deposition and is also not the $2 value that one obtains when applying his loss of value formula.

132.   All of Dr. Harris' calculations take as their starting point the consumer's willingness to pay for "lights" cigarettes that pose low risks. This willingness-to-pay value equals the product price plus the consumer surplus. Except for the most marginal consumer who would stop buying "lights" cigarettes if the price increased by an infinitesimal amount, such as a penny, Dr. Harris's damages formula always includes compensation for some or all of the value of subjective consumer surplus that is lost. These are not losses of property but abstract losses in terms of consumers' subjective valuations of the product at levels above the product price.

133.   To summarize: i) Dr. Harris uses a damages approach that is not loss of property but is based on benefit of the bargain; ii) the loss of value calculation approach that he articulates is not what he did when calculating damages, iii) his response to what the damages would be in the deposition hypothetical example contradicts both his loss of value principles and what he actually did when calculating damages.

B.   Dr. Harris' loss of market concept lacks empirical import.

134.   Dr. Harris claims that under his loss of market approach "lights" cigarette brands "would never have been sold in the first place, or would have been discontinued soon after consumers have learned that such brands do not reduce harm" [Harris Expert Report, Schwab (Feb. 28, 2005) ¶ 24]. This claim is never documented and is false.

135.   Consider the two possible empirical justifications for this market assessment. Dr. Harris' discussion of the Dennis Knowledge Networks survey of the large discount smokers would require to purchase "fake lights" in a world in which "true lights" exists does not show that the market for "lights" cigarettes would not exist. The Knowledge Networks survey results pertain to a world in which "true lights" exist, whereas in reality they do not exist according to the claims made by the plaintiffs. Real-world smokers cannot switch from "fake lights" to "true lights" after learning that "lights" cigarettes are as risky as regular cigarettes. Given that there is no "true lights" option available for purchase, the survey has no empirical implications whatsoever for whether people would have switched to regular cigarettes, continued to smoke "lights" cigarettes, or quit smoking altogether. Dr. Harris admits the nonexistence of "genuine lights" means his damage estimate does not estimate out-of-pocket loss in the real market [Harris deposition, Schwab (Mar. 10, 2006) 605:20-24].

136.   The Hauser survey results likewise do not prove that the market for "lights" cigarettes would no longer exist. Indeed, the results show that the average consumers would not switch to regular cigarettes once they believed that "lights" were as risky as regular cigarettes. First, the utility value that the average consumer derives from the taste of "lights" cigarettes exceeds that for all other choices. Thus, if "lights" cigarettes and

regular cigarettes have the same risk properties, the average consumer will prefer "lights" cigarettes.   To put the degree to which consumers prefer the taste of "lights" in perspective, note that the average utility value difference between the taste of "lights" and the taste of regulars exceeds their average valuation of the risk difference between "lights" and regulars (Exhibit G to Hauser Expert Report, Schwab (Aug. 22, 2005)). Second, more the half the respondents to Dr. Hauser's time study continue to smoke "lights" cigarettes, despite the fact that only 14.7% of them consider "lights" safer than regular cigarettes.

C.   The constraints imposed by both Drs. Hauser and Harris bias Dr. Harris' analysis.

137.   As discussed in Section IV, Dr. Harris creates an upward bias in his estimates by his treatment of respondents with negative utility for decreases in risk. Many respondents had a negative valuation of increases in cigarette safety.   The proper statistical approach in calculating damages based on the sample is to use the utility values from the entire sample, both positive and negative, and to average the results across the entire sample. Not doing so leads to a biased mean estimate.

138.   What Dr. Harris does instead is to eliminate all responses in which the health risk valuations had the wrong sign in which safer cigarettes had a lower utility [Harris Expert Report, Schwab (Sept. 6, 2005) ¶14]. Dr. Harris' arbitrary elimination of all responses implying a negative damages value creates an upward bias that nearly doubles the estimated damages.   The average utility loss per pack would be less if Dr. Harris followed the proper economic and statistical approach of using the results from all

observations, including those that decreased the damages amount as well as those that decreased the value of damages.

D.   Dr. Harris' two survey bases cannot both be correct.

139.   Dr. Harris in his deposition does not place greater reliance on either the Hauser results or the Knowledge Networks results [Harris deposition, Schwab (March 9, 2006), 434:1-4]. Yet the 95% confidence intervals for the diminution in value do not overlap. Consider the "just as harmful" case. The confidence interval for the Knowledge Networks results is 72.3 to 77.5%, and the confidence interval for the Hauser results is 46.8% to 53.5%. (Harris Expert Report, Schwab (Sept. 6, 2005) ¶13; Harris deposition, Schwab (March 9, 2006) 434-435). These results are inconsistent and demonstrate the failure of the diminution in value estimates to be replicable using different methodologies.

VI.   Dr. Beyer also misuses the results of the Hauser conjoint analysis.

140.   Dr. Beyer states that Dr. Hauser "found that 90.1% of light smokers relied on the health claims in smoking light cigarettes" [Beyer Expert Report, Schwab (Dec. 19, 2005) ¶39]. He then uses the 90.1% figure as a measure of the share of consumers who suffered losses.

141.   Dr. Beyer's approach errs in three ways. First, even taking the 90.1% figure at face value, it does not imply that 90.1% of "lights" smokers relied on the health claims. What that figure does indicate is that 90.1% of the survey respondents who were given a risk hierarchy in which "lights" were positioned as being less risky than regulars had a positive subjective value for the safety of "less than ultra-lights" to the risks of "greater

than regulars." Given the tautological nature of the survey question structure, one might have even expected that 100% of the respondents would have expressed a positive subjective value for a less risky cigarette.

142.   Second, the survey in no way incorporated any reference to possible wrongful conduct or health claims by the industry. It simply did not pertain to those issues at all. Third, even if 90.1% of "lights" cigarette smokers place a positive subjective value on the greater safety of "lights" cigarettes, this figure does not imply that any consumer would have stopped purchasing "lights" cigarettes if they were as risky as regular cigarettes, much less that 90.1% of consumers suffered a loss of property. The survey cannot be used to determine who would have stopped purchasing "light" cigarettes had it not been for possible wrongful conduct. The 90.1% figure is a number, but it is not a number that is pertinent to calculating injury to property.

143.   My opinions are stated to a reasonable degree of scientific certainty. I reserve the right to supplement or modify my opinions based on additional information I may receive. I am compensated at a rate of $850 per hour.

Respectfully submitted this ___23___ day of ___MAY___, 2006.

W. Kip Viscusi

W. Kip Viscusi, Ph.D.